SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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IMPROVED MEASURING PUMP.

A combined pump and measuring apparatus, which is said to be efficient in action, has been invented by Mr. GEORGE WOOLFE, of St. Louis, Missouri. The pump is provided with a tray furnished in front with an arched support which fits over the curve of the barrel, and at the back with a set screw, by means of which it is fixed to the barrel and adjusted to a horizontal position. This tray is lined with sheet metal, and in it are placed the vessels to receive the liquid. A vertical tube fixed at the rear end of the tray, and passing through and below the same for a considerable distance, enters the bung-hole of the barrel, and between this tube and the tray is an orifice by which the drippings or overflow are led back to the barrel through a vertical channel or groove formed on the periphery of the pump barrel or cylinder. Into this vertical tube the pump cylinder is inserted, and fits snugly; it is furnished at its lower end with points which enter the bottom of the barrel, and thus retain, in conjunction with the tube, the pump cylinder in an erect position. The pump is provided at its lower end with an orifice or orifices, over which an inwardly opening disc valve is fitted and operates; this valve is furnished with a stem which protrudes through the lower end of the pump cylinder, and carries a head; around this stem, and between the head and end of the cylinder, is a spiral spring tending to hold the valve down to close the openings.

This piston of the pump is composed of an elastic ring, held between two plates, and furnished with openings over which a disc valve is fitted. This valve opens downwards by reason of a spiral spring surrounding the piston rod. This piston rod passes through the closed end of the pump cylinder, and is jointed to a connecting rod, which is connected with a crank on a shaft provided with a crank arm for turning the same. This shaft passes through a bearing formed in an arm, which is mounted on the pump cylinder. On this arm is affixed a graduated dial, behind which is a ratchet wheel, which carries on the outside of the dial a hand or pointer capable of travelling over the face of the said dial. This ratchet is placed in such proxmity to the shaft that a tappet on the shaft strikes the ratchet wheel, and moves it one tooth at every revolution of the shaft or complete stroke of the piston. In order to dispense with the funnel ordinarily employed, and to direct the discharge of the liquid directly into the receptable which is to receive it, the discharge spout of the pump is carried to an elevated point, and is provided with several telescopic sections, the lowest one of which is formed with a flange which fits over the mouth of the receptacle into which the liquid is to be discharged; this section is also provided with a small neck, which enters the receptacle and prevents spilling.

GEOLOGY OF IRON.—The admirable papers on the Geologie des Eisens, by Dr. E. Reyer, published in the Oesterreschischen Zeitschrift für Berg und Huttenwessen, has been reprinted in pamphlet form, and will be widely appreciated for reference.

IMPROVED METALLIC ALLOY.—In manufacturing his improved alloy Mr. K. H. KUHNE, of Loebtau, near Dresden, melts 13½ per cent. of copper and 7 per cent. of tin in the usual manner, and whilst in a molten state there is added to this ¾ per cent. of phosphorus. While adding this phosphorus the molten metal should be well stirred. Lastly, 9 per cent. lead is added to the molten mass, and the whole is well fused. In casting this alloy care should be taken to pour it out of the vessel in as cold a state as the fluid metal will allow. If the fluid metal is poured into a form or mould of considerable capacity or cubic content the metal may be poured out in a cooler state than in casting thinner or finer articles. The alloy having great resistance or toughness, combined with softness, it may be used for many different purposes, as, for instance, for bearings, for fitting, for axle boxes, for valve seats, for piston rings, and the like. He does not confine himself to the employment of the above described alloy for the purposes mentioned, nor does he limit himself to the exact proportions of the copper, tin, lead, and phosphorus as stated above, though the said proportions have been found to answer very well in practice.

Original Correspondence.

COLORADO MINES—No. XVI.—SILVER REDUCTION.

Sir,—My last Article, No. XV., treated on the practical and profitable reduction of low-grade gold-bearing ores. This one is on silver of the ordinary kinds found in the silurian formation, of which there are large quantities produced; as an instance for reference we will take the Old Caribou Mine, of Boulder County, which is now about 1000 ft. deep, and still improving in depth. An illustrated report of this mine was published in the Journal some six years ago by the writer. A few remarks then made in relation to the lower deposits of silver in the lode have since been verified, and that report is now very interesting. The stratum is chiefly a porphyretic granite. Greenstone, vitreous quartzite, dark-blue fine grained gneiss, which is the great silver bearer when accompanied by sulphate of baryta, hornblende, and dolorite occurs, and all the schistose rocks in their numerous varieties. In these a system of partial stratification is apparent, and little veinlets of white quartz cross through the lamina, which if near a lode fall into it, and act as feeders. Magnesian, aluminite, and secondary granite complete the lithology of this formation. The gangue or veinstuff of the lodes is composed of all the above as a mixture homogeneous. The metalloids are zinc blende, ferruginous quartz, magnetite in fine cubical prills associated with brown oxide, the manganite of iron—a little antimony is diffused throughout with some mundic. The cementing medium is silica, rendering the ore very hard. Sulphuret of lead is very sparingly distributed. Some grey and yellow copper occurs. The first may be called fahlerz; it is very rich in silver. The lode varies much in quantity; but there is not much diminution in quantity on an average. The silver may be taken as an aggregate at 120 ozs. per ton. Metallic or native silver occurs in one of the caunter lodes. Specimens have been taken out weighing 2 lbs. solid metal. Many joints of the rocks are coated with a film of pure silver. A cross-course of magnetic iron, about 300 ft. wide, terminates the sett on the east. In the centre of it is a little stratified vein, so highly magnetic that it may be called "loadstone." The surveyor's compass is of but little use within several hundred feet of this cross-course, for the needle turns in every direction. An electric current passes from here into and through the lodes for a considerable distance; its greatest influence is felt where small veins come into or cross the main lode. We may attribute the presence of metallic silver to the electric or galvanic action emanating from the magnetic dyke. Although most of the ores are very hard yet they are brittle, and are easily pulverised under dry stamps, and freely part with their silver by mercurial amalgamation.

Reduction Works.—At the village of Nederland, about five miles from the mines, is the finest establishment of its kind in the country. It has been built regardless of expense, and on the most modern improvements. It is in terraces, starting up the hill from the river below. The process of reducing the Caribou ores may be simply described as follows:—They come down from the mines, and are dumped into a large room, having a storage capacity of 300 tons. This is the upper floor, and on a level with the country highway road. The large blocks are here spalled down to 6-in. pieces, and shovelled into a Blake crusher, which is fixed on this floor. After passing through this machine the broken stone is about 1 in. square. It then falls down to an iron-plated drying-floor in the next terrace below, about 8 ft., which is heated by the waste gases of the furnaces. When greater drying speed is required an auxiliary furnace is employed, It is essential that the ore should be thoroughly devoid of moisture—for let it be understood as it comes from the mine it contains from 8 to 12 per cent. of water, and which takes some time to evaporate. When thoroughly dessicated it is passed into the stamps, which work very fast, driving the granulated ore through a 60 or 80 mesh screen into a close covered trunk, for it is now in the form of a fine dust. In this trunk is an archimedian carrying screw, running the entire length of the batteries, and delivers it into a set of bins, which have to be made air-tight. The contents of them at proper intervals are taken out and placed on a mixing floor, where from 6 to 10 of per cent. of common salt is added and well incorporated with the pulp (so now called at this stage of the operation). The quantity of salt is regulated by the amount of refractory minerals the stuff may contain—such as sulphur, antimony, arsenic, and blende. On the floor below is a range of Bruckner's calcioing and chloridising revolving furnaces; they make one revolution in 3½ minutes. Underneath them runs a line of tram-rails, on which is an iron wagon of sufficient capacity to take the charge of one cylinder, which runs into it by way of the inverted man-hole. Plug-holes are arranged, from which samples are taken at intervals to test the progress of chlorination. This can be done on test-paper on wetting the sample; but the furnaceman generally depends on the smell. If there is no odour of sulphur he concludes that the charge is working off fairly; it takes from 8 to 14 hours. The charge is from 1 to 1½ ton, and sometimes to 2 tons, depending on the nature of the ore. The red-hot pulp is now conveyed to a brick-laid cooling-floor at one end of the building, where a hose with a jet of cold water is played upon it. It is now supposed to be chlorodised up to 85 per cent., but it really is not so on an average. I object to the practice of mixing the salt in the dry ore before being run into the cylinders, as it is wasteful, and, being worth 10*l*. per ton up here, is quite expensive. The cylinders are properly lined with fire-brick, and after the discharge of their contents remain red hot for a long time unless allowed to stand and cool down, which is a waste of time as well as fuel. The proper way for continuous working is to run the crude pulp or ore into the cylinder, and lower down to a cherry heat, increasing the speed a little. The sulphur will now gradually be eliminated. After four hours the heat should be increased, which is regulated by the dampers in the flue leading to the dust chambers. The speed of the cylinder should now be reduced. The arsenic now goes off, and the sample tested by reagents, or by a combustion tube. Next is the volatilisation of the antimony, which requires a nearly white heat, and here lies the chief part of the art of the process, for the ore may sinter if the heat is carried up too high. By sintering I mean that the iron becomes melted, and the whole charge is then spoiled so far as the silver is concerned. It is safer to let a little antimony remain in the charge rather than run the risk of the ore becoming sintered. At this stage of the operation, which will be about six hours, the cylinder is stopped, and the salt run in, and nearly closing the dampers, with the fire-doors thrown open. It immediately decripitates, and a dense volume of chlorine gas is evolved, which, having a much greater specific gravity than the heated air, will lie on the bed of the incadescent ore in the bottom side of the cylinder, and rapidly absorb it. The cylinder is now again put in motion slowly, the fire-doors closed, and the draft regulated at its minimum, so as to confine the gas in the cylinder as much as possible. If the salt is put into the ore with the charge when the furnace is at a high heat the chlorine gas goes off with the gaseous products of the fuel, and thus lessens its utility. The salt used should contain 96 per cent. of chloride of sodium; but such is not readily obtainable, as much contains a large percentage of sulphate of lime (gypsum) and other calcium salts. By adopting the foregoing mode with care 90 per cent. chloridation of the ore can be effected, and which is quite sufficient. A tier of eight Bruckner's can be operated by eight men, five by day and three by night, and will turn out 20 tons of ore; they take about three-quarters of a cord of wood each per day. The chloridised ore is now run through a ball pulveriser, which separates the concreted lumps, and sifts the ore very fine. It is then placed in the amalgamating pans, of which there are a variety—Hepburn's, Wheeler's, or Varney's all work very well; some work faster than others. A certain quantity of mercury and a little quicklime is charged with the pulp, and the amalgam taken out every eight hours and sent to the retort-house, where after the usual filtration the paste is distilled, and the superfluous mercury driven off and condensed. The silver now is 96 to 98 fine. The overflow from the pans runs into large settlers having revolving agitators. The flowered and floating mercury here falls to the bottom, and is tapped off once or twice a week or when the clean-up is necessary. The tailings contain a good deal of undecomposed matter, chiefly sulphuret of iron, which carries gold, and pass into a pretty little machine, known as a Hendy concentrator. It separates all the metallic particles, and the residue is now worthless.

Such is the practical *modus operandi* for the reduction of silver ores. There are many minor details in the manipulation which may be noticed—one especially. Samples of the crushed ore should be sent into the laboratory and assayed, to ascertain what it contains, a report of which is handed to the mill foreman as a guide for him in running the ores through the furnaces. This done everything goes on well. From the foregoing description it will be seen that a very small amount of skilled labour is required to carry on an extensive reduction works. Charles S. Richardson, G.M.E.

Alma, March 21.

SOUTH EAST WYNAAD ESTATES AND GOLD MINING COMPANY.

Sir,—My attention has been called to the printer's error in last week's Journal, when the assay of our ores was incorrectly given. Would you oblige me by publishing the correct one:—

Elizabeth Reef.	Ozs.	dwts.	grs.	
E Gold.....	1	1	5	per ton of 20 cwts.
Silver	1	3	0	„
Copper	0·32			per cent.
Siliceous residue	80·65			„
Tea Reef.	Ozs.	dwts.	grs.	
T Gold.....	2	4	2	per ton of 20 cwts.
Silver	4	11	0	„
Copper	0·50			per cent.
Siliceous residue	78·60			„

Queen Victoria-street, April 12. W. H. Thompson.

GOLD AND DIAMOND MINING IN SOUTH AFRICA.

Sir,—The Anti-Illicit Diamond Buying Association, or as some call it the Diamond Mining Protection Association, held a meeting at the Mining Board Office on the 3rd inst. It will be remembered by some of your readers that in my letter of Nov. 16, in refering to this association, I said "It is thought many old hands will endeavour to hide themselves behind the flimsey screen of a big subscription list." This idea is borne out by the fact that the traffic in illicit diamonds is more rampant now than before the formation of the association, and this to my mind is very natural, seeing that all the members of the association are conversant with every detail of its internal arrangements. Nothing is easier than for illicit diamond buyers who are members of the association to divert a current of suspicion into an innocent channel, and thereby enable them to indulge in the nefarious practice with impunity. It is universally admitted that diamonds to the amount of one million sterling are stolen annually, and I believe this to be much below the mark. This traffic has a very demoralising effect on the natives as well as low whites, but the greatest sufferers are the shareholders of *bona fide* companies. There is nothing new stirring in the mines, save that at Kamfer's Dam they are finding diamonds. I saw about 60 carats from there on the 3rd inst; they were small, but of good quality. I do not think they can pay expenses as yet, but as soon as they have a full supply of water they ought to leave a small profit; whether they will do so or not remains to be proved.

The latest accounts from the Lydenburg gold fields says the diggers *una voce* are determined to resist any interference with their rights, and the new Gold Commissioner, who has been appointed by the Transvaal Government, and who is a Dutchman, has resigned his office, because he will not be a party to join in the robbery of the diggers. This shows that there is at least one honest man in the Transvaal. The diggers have posted notices all around their claims warning any person against trespassing or in any way interfering with their rights. One obnoxious individual has already had a taste of summary justice by being dragged across a river, and the diggers vow that will serve him worse if he interferes with them further. No person can blame the diggers, if deserted by their own Government they stand up for their rights.

The people of England know very little of the true state of affairs in this country, for while they hold indignation meetings to protest against the prosecution of the Jews in Russia they wink at the persecution and robbery of Englishmen by Jews and Hollanders in the Transvaal. The British resident of the Transvaal is a farce, and is merely the medium through which a few Hollanders can insult the British flag and crown. Every effort is being made by the concessionaires of the Transvaal to induce persons to search for gold. I have taken the trouble to visit many of the places said to be rich in gold reefs, and to my disgust there was neither gold or reefs. Corruption and bribery is at the bottom of the whole affair. Reports are sent to all the newspapers, with a view to excite the public, and induce speculators to buy worthless farms at high figures.

The only part of South Africa likely to be rich in gold is from lon. 27° to 33° east and from lat. 15° to 20° south. The gold in this part of the country is found in a very hard ironstone, and runs in small veins, varying from 1-16th of an inch to 1 in. thick; these veins are composed of oxide of iron, friable quartz, and pure gold. The very thin veins contain a good percentage of sulphuret of gold, which has hitherto been thrown away. Gold from this part of the country has been scattered throughout the Transvaal, and two or three very enterprising individuals have taken to manufacturing veins, and can tell the speculators to within an inch where they will find the riches. In breaking up a small piece of veinstuff, which was given to me as fresh from a pit, I found it to be very rich indeed, but in the cavity of a bit of gold I found a bit of tobacco, and in the matrix I found a bit of gunney-bag, plainly showing that the manufacturers had still a little to learn. If I had not found these direct evidences of rascality I have a sufficient geological knowledge to know that the formation was modern. Desperate efforts are being made here to try and induce working men to go to the Lydenburg gold fields, but most people have been once already, and know to their sorrow what the place is like. I have already informed you that there are about three places that will pay, and those places are already in the hands of diggers, and it is alone on the strength of these places that a few unscrupulous adventurers are trying to get up an excitement in the Transvaal.

The most abominable falsehoods are circulated with regard to the Lydenburg gold fields. It is said that "the concessionaires have compensated, or come to terms, with the diggers," but this is a deliberate falsehood, and is circulated for the purpose of trying to induce persons to purchase a slice in the concessions. If any person should purchase an interest in these concessions they will find they have purchased an interest in the unjust persecution of a few honest old diggers, whose legitimate interests I am sure every honest man will endeavour to support. The newspapers here state that one Benjamin has agents in Hamburg for the purpose of engaging 300 German miners, with their wives and families, to proceed to the port of Delagoa Bay, and from there to Pilgrim's Rest. I will undertake to say that if such a scheme be attempted one-half will die before they reach their destination. From Delagoa Bay to Pilgrim's Rest the climate is only tolerable for Europeans during the months of June, July, August, and September, and then only for such as are thoroughly acclimatised. An old digger, writing to the Echo, says "the reason the Government are instigating a few Shylocks to rob us is because we are Englishmen," and he is pretty correct.

I will endeavour to supply you with correct information with regard to the Transvaal, because there is not only an attempt to rob British capitalists, but there is every probability of a civil war. The following is from the Pretoria Advertiser:—

I understand that Messrs. Gates, Seavill, and Co. have paid Mr. Jennings a sum of money to be relieved of their Blauwbank gold mining speculation. Thus the first gold concession granted by the Government has proved a failure.—Can anything be more depressing than the appearance of Pretoria at present? Shops open certainly, but none but proprietors or employees inside. Streets empty, except when an occasional nigger, tired of sleeping in the shade, comes out to see if there is any change. And silence, broken at intervals by the crowing of some irrepressible cock. Add to this a generally unclouded sky, a fierce sun, and stifling heat, and one has a fair view of the business aspect of Pretoria in 1882.—Commandeering has been pretty lively in Potchefstroom, and the English portion of the inhabitants have had to contribute their full quota. Several hundred men are also required from the district. Now that Kalafin, the cause of the commando, has made some sort of arrangement with the Government, we hope those enrolled will be speedily dismissed.

The Mercury's Cape Town correspondent wires that the Transvaal Government are arming a commando of 2000 men, to proceed against the native tribes on the western border, who refuse to pay taxes to the Republic.

Kimberley, March 9. Correspondent.

GOLD AND DIAMOND FIELDS OF SOUTH AFRICA.

Sir,—We have just been favoured with a beautiful rain, and the temperature at the present time is very refreshing. In the Journal of the 4th ult., just to hand, I observe that in my letter referring to the failure of Mr. McKenzie, of Cape Town, it says "his scrip is not worth more than 9000*l*. or thereabouts;" it should have been 90,000*l*. or thereabouts. It will be remembered that he paid for these shares 288,000*l*. 10s. Money is very scarce throughout this camp, and speculation is dull. The Diamond News says:—

If at any place "the world is out of joint" it is here. I am very sorry indeed to hear that the Public Library is likely to go the way of most public institutions calculated to benefit the community. Had it been a society for the Promotion of Illicit Diamond Buying, or an Association for the Floating of Bogus Companies, or even a Guild of St. Alcohol, formed for the Propogation of Delirium Tremens, it would no doubt have been well kept up.

There is some little excitement here at present owing to the shameful manner in which the trapping system is being used for the purpose of ruining honest men who happen to be obnoxious to the wealthy illicit diamond buyers. No person who has the courage to expose the rascality of this place is safe, because false oaths can be manufactured, and procured from the Kaffirs at a liquor a piece. I write what I know to be facts, and can prove it through the most able soldier and administrator that ever governed in this country. The latest attempt to ruin an innocent man has just been tried on Mr. Wm. Houton, the Editor of the Comet newspaper. Mr. Houton has had the manliness to expose real swindles, and, consequently, every attempt is being made to ruin him, and stifle enquiry. I must say at the present time every local paper is doing its best to remedy the evil inaugurated by the company mania, and place *bona fide* companies in the position they deserve. Their efforts are not in vain, and I have no hesitation in saying that during the last six months there has been a decided improvement in many of our companies.

I have just seen a nice parcel of diamonds from Koffyfontein, and the reports from there are more satisfactory than they have been for some time. At Otto's Kopje they are preparing a large quantity of blue diamond soil for washing. At Kamsfersdam they are still short of water for washing. Several private parties are prospecting for diamonds on the Hart River, but hitherto without success. Great hopes are entertained here that the whole of the De Beers Mine may be refloated in Europe as one company. The north and north-east part of the formation is certainly very good, as I have pointed out on previous occasions. The majority of the companies in the Kimberley Mine are crippled with fallen reef; in fact, at the present time the Central is the only company in full swing.

News from the Transvaal is of a very disquieting nature. We hear of wars and rumours of wars all around the border. Reports from the Tatin gold fields continue to be very satisfactory. The excitement about the Transvaal gold is subsiding. News from Pilgrim's Rest is not of a very encouraging character. The few claims on Brown's Hill, to which I have frequently referred, are turning out just as usual, and the men are doing fairly well—otherwise the prospects are not good. The diggers say they can find traces of gold all over the country, but nothing to pay. I received a letter from an old digger on Friday saying—"Twenty persons had arrived at Pilgrim's Rest from Capetown, armed with white umbrellas lined with green, to work for Mr. Benjamin." They were a source of great amusement to the old seasoned diggers at first, but they are now the objects of their sympathy, as most of them are already suffering from the effects of the climate. The claims of C. K. White, Hampson, and Co. are turning out fairly well. These are at the Waterfall diggings. I have seen the gold from this place; the vein appears to be narrow, but of very fair quality. The other place of any value is at Spitz Kop. The concessionnaires still speak of getting out families from Europe to people the fever districts of the Transvaal. There are far more here at present than can find work, and in other parts of the same, as may be seen from the following:—

Jagersfonteis.—A correspondent of the Friend says:—"Over 50 respectable white men are working about looking for employment of any kind, but without success. Some of these young fellows are almost starving; never in all my travels through the colonies have I seen such want and misery amongst white men as I do here in Jagersfontein."

The following has been published this minute before going to post:—

War on Northern Border.—The latest news from the northern border is to the effect that 500 Boers and Koranuas were laagered between Poquanwi and Taungs. They have over 130 wagons, and have declared their intention of attacking and burning Taungs on the 13th inst., and occupying the Keat Award Territory. They are threatening to hang or shoot several Englishmen, amongst whom are O'Reilly, Cecil King, Dumas, Bethel. All Europeans with the exception of King and Dumas have left Taungs. It is said that the Boers have announced their intention of bringing O'Reilly's head into Christiana. Affairs are in a most serious and desperate condition, and Imperial interference is anxiously hoped for.

Kimberley, March 16. Correspondent.

SOUTH AFRICAN DIAMOND FIELDS.

Sir,—It is six months ago since I wrote a letter to the *Mining Journal* calling attention to the fact that owing to the success of one or two companies unscrupulous speculators were starting unprofitable concerns in almost every direction. I knew at the time that attempts were being made to saddle the English investor with properties that were of no value, and could only end in ruin to the investor, and consequently to the true interest of South Africa.

Since my first letter to the Journal I am pleased to note a decided change for the better in several companies; but there is still great room for improvement in the best of them, and until the majority of the companies are wound-up and reorganised on a sound basis the prospects of this place cannot materially improve.

As soon as my letter appeared I was assailed from various quarters in a manner quite beyond the range of fair criticism, and every attempt was made to prove my statements to be untrue. I, therefore, feel it my duty to use every legitimate means to corroborate the truth of my statements, and, consequently, I append the address of the President of the Cape Town Chamber of Commerce, written six months after I cautioned the public through the Journal. If the President had taken his key-note from my letter of Sept. 16 his speech could not be in more perfect harmony with it.

Kimberley, March 16. Thos. Collingwood Kitto.

The President of the Cape Town Chamber of Commerce on Diamond Mining Companies.—In my address last year I drew attention to the formation of companies for diamond mining, and expressed my fears that it led to undue speculation. I regret that these fears have been only too fully realised; the rapid development of these companies in 1880-81 has led to very disastrous results, and the reckless speculation in shares, without any reference to the probability or even possibility of these ventures paying, has aptly been termed the diamond share mania. In its main features and general results it resembles many other speculative fits, which seem to affect all commercial communities of the world in recurring periods. In many respects the diamond speculative mania of 1880-81 in claims and shares has a striking resemblance to the speculations in Cape copper mine shares some 28 years ago. In both cases the mines were worked by private individuals for some time before any general movement was made to consolidate the work of such individuals into companies. In the copper as in the diamond mania the success of one or two adventures was followed by the formation of companies for the purpose of working promising centres, and those in turn were followed by scores of untried and worthless claims. In many instances the claims selected were reported to be of incalculable value, and in the formation of companies the original lessee put a fictitious value on the claims. The only result of companies promoted on such terms was loss to those interested resulting in a monetary crisis affecting more or less all classes of the community. It is difficult to estimate correctly the amount of capital invested in diamond mining companies, but a careful examination of the share list and prospectuses published in 1880-81 yields results which are approximately correct. In the two years ending December, 1881, 65 companies were promoted; these companies represent a nominal capital of 7,564,690*l*. in shares, of which 6,941,115*l*. is represented as paid-up, leaving 15 liable to calls in shares varying from 2*l*. to 50*l*. per share. The capital contributed to the working of the concerns, in most instances, has not been more than about 25 to 23 per cent. of the total said to be paid-up. The original claimholders retained three-quarters, or two-thirds of the amount as fully paid-up shares, as payment for scrip and plant. In the formation of the earlier companies the value of the claims and machinery bore a fair proportion to the nominal value of shares returned, but when it was found that shares were sold as high as 200 to 300 per cent. above par, and the claimholders placed their reserved shares in the open market, it led the proprietors of inferior claims to combine in the formation of companies to work mines that were known to be unproductive. Under such circumstances ordinary business foresight should have warned investors of the dangerous character of these securites. Of the 65 companies registered not one shows any reserve fund or balance after paying dividend. In November last I find two companies paid dividends equal to 40 per cent. per annum; one company paying dividends equal to 30 per cent. per annum; one company 20 per cent. per annum; and four companies less than 5 per cent. per annum, whilst 57 companies had paid no dividend whatever up to that date. As all the companies are registered as limited it is fair to assume that the shares subject to call

were allotted, and the paid-up scrip apportioned amongst the original claimholders and promoters. It is impossible with the data accessible, to estimate the amount of colonial capital invested in diamond shares, but I am enabled from the published lists to arrive at the following amount of capital said to be paid-up:—Kimberley, 2,495,150*l.*; De Beer's, 1,845,100*l.*; Dutoitspan, 1,552,140*l.*; and Bultfontein, 785,900*l.* The above figures include the amount of shares allotted to original proprietors and those held by subscribers in the colony, but does not include several wealthy companies who are working valuable claims, but whose shares have not been placed in the colonial market.

GREAT SOUTHERN MYSORE GOLD MINING COMPANY

SIR,—In the Journal of Feb. 18 is a letter from Mr. C. F. Bray, late manager of the Great Southern Mysore Mine, in which he says —"As to the quartz carrying sulphurets there is not a bit of anything of the kind to be found on the company's claim; and the only place I ever saw a bit of anything of the kind was a few small specks of copper pyrites which the manager of the Mysore Reefs brought to show me, thinking it was gold." As the manager referred to I beg to contradict this statement. I showed the sample to Capt. Bray. I also showed it to Capt. Jarvis, of the Madras Mine, expressing my belief that it was copper pyrites, but in this neither of these gentlemen agreed. I said, well whatever else it may be I am certain it is not gold. A few days afterwards I saw Capt. Bryant, of the Ooregum Mine, and showed it to him. He at once said—"It is copper pyrites, for you know I am at home amongst copper."

As a personal favour I ask the insertion of this letter, as it would be a very serious matter for anyone in my position to be supposed incapable of distinguishing between copper pyrites and gold.

HENRY MOON, M.E.,
Manager of the Mysore Reefs Gold Mining Company's.

Kolar-road (Madras Presidency), March 14.

MYSORE GOLD MINING COMPANY.

SIR,—As Capt. Rogers, the manager of this company, by his letter in reply to Capt. C. F. Bray, maintains that the profitable character of this company's lodes are undoubted perhaps he will be kind enough to explain why he did not partly clean-up, as he stated he intended to do in his letter to the board of Oct. 24, so that the yield of the quartz crushed by the Elephant stamps might be ascertained. In his previous letter of Oct. 17 Capt. Rogers stated the Elephant stamps had been working steadily for the last week, and not until Oct. 31 does he propose to close down the stamps for want of a sufficient supply of water—so that the stamps must have been working at least 21 days. Now, two heads of Elephant stamps will crush 20 to 30 tons per day; but, estimating the crushing at only 20 tons per day, the quantity crushed should be at least 400 tons, which should afford a pretty conclusive test of the auriferous quality of the quartz. Yet, although Capt. Rogers stated his intention to "clean up" in a letter dated Oct. 17, and stated so again in a letter on Oct. 24, he has not ventured to carry his intentions into effect. I, therefore, think with Capt. Bray that Capt. Rogers' failing to clean up leads to the inference that "nothing was got from the quartz crushed in the shape of gold." Were I a director of this company or a shareholder I certainly should demand to know why the clean up has not taken place, and the result publicly announced ere this.

April 13. AN UNBELIEVER IN INDIAN GOLD MINES.

THE WEST AFRICAN GOLD MINES.

SIR,—A very large holder of shares in the West African Gold Mines has called my attention to a paragraph which appeared in the Daily News, of March 17, in which a correspondent of that journal "earnestly expresses a hope that those who are offered shares in Gold Coast mines will inform themselves of the deadly nature of the climate for Europeans," and also asserts that "a white man cannot live there and work, the natives cannot be induced to work, as soon as a road is made the jungle grows over it again, the air is poisonous, and the people are debased beyond conception." Having first landed on the West Coast of Africa exactly thirty-one years ago, since which time I have spent less than six years in Europe, the remainder of the period being passed on the Coast, the Gold Coast colony included; and, moreover, having returned from a visit of six months to the gold mines so recently as the end of July last, I trust that you will kindly permit me to contradict in the most unqualified manner all the statements of the unknown correspondent of the Daily News. The mere fact that I have passed more than half my life in western equatorial Africa, including one continued residence there of ten and another of five years, and am now in good health, and that I can name many Europeans and Americans who have spent as many, if not more, years there, is in itself a sufficient refutation of the supposed (and quite illusory) "deadly nature of the climate for Europeans," when they are not constitutionally unfitted for residence in tropical regions and will take proper care of themselves and listen to ths advice of "Old Coasters." If they are physically unfit and will not live as they should do they have no business in Africa, but hundreds go there every year, enjoy fair health, and return to the Coast again and again. I have had under my orders at different times, a very numerous staff of Europeans, both on shore and afloat, and the sickness and mortality among them has been exceptionally small. Between 1857 and 1862 I loaded no less than sixteen vessels, and did not lose a single man belonging to any one of them; I treated their crews for fever, dysentery, &c., myself, only calling in medical aid on one or two occasions. I can testify that merchant seamen on the West Coast had to work very hard at the time I am speaking of, and many do so still, as do also many of the clerks and assistants in the various factories and hulks—the latter almost invariably re-engage for the Coast after a brief spell in England.

Idleness, not work, is the bane of Europeans in Western Africa, as well as in other tropical countries, and when to idleness is added the neglect of ordinary precautions, and the abuse (not the moderate use) of alcoholic liquors, who can wonder at Europeans failing to withstand a climate which, of course, is not exactly that of Maderia? But as a rule the most healthy, because the most industrious, of white residents in Western Africa, including the Gold Coast, are Englishmen, Americans, Germans, and Dutchmen. Commander V. L. Cameron, who is at this present moment on the Gold Coast in company with Captain R. F. Burton, has told us that last year, when surveying the Akankoo concession, he worked for days together up to his middle in water—and lived! Captain Burton himself, in a letter written in February last to the directors of the Guinea Coast Gold Mining Company, speaking of Apollonia, says:—"During the hot hours the 'doctor'—that is, the sea breeze—blows freshly, the evening temperature is delicious, and during the cool dewy nights we found blankets necessary."

I visited all the mines then being worked, and saw upwards of 30 Europeans of various nationalities who both worked and lived. I also saw very large numbers of natives, as well as several hundreds of Kroomen, who worked regularly, both day and night, at the mines, and in transporting heavy machinery and other goods from Axim to the different mines at and near Takwah. I travelled, partly by hammock, partly by boat and canal, as well as on foot, over Wassaw, Egwira, Apollonia, Axim, and Apatim, meeting hundreds of native carriers transporting provisions, pieces of heavy machinery, and other articles by road and river without overseers, and by whose means, aided by Kroomen, everything now at the mines had been carried there, with little loss by accident or theft. I slept in native huts without doors or fastenings, and at Axim my bedroom door and windows remained open day and night, yet the whole extent of my loss by theft during six months was one plated table fork, stolen on board a steam launch. Surely this does not look as though the "natives cannot be induced to work," or that "the people are debased beyond conception." On the contrary, having visited most places between Gorée and the Congo, I am happy to state that I found the natives of the Western Province of the Gold Coast colony exceptionally honest for negroes. As to work, we all know that the negro has no abstract love of labour, but he can and will work for gain, and work well. Moreover, whenever it may become necessary coolies in any number can be imported from China and India, and this is already under consideration.

Roads can be made and kept in order where the traffic is sufficiently great to counteract the rapidity of vegetable growth incidental to a tropical climate; and here again I may quote Capt. Burton's letter, in which he says, "A good line was cut from the village to the concession. A 'sulky' could easily have been driven along it." I am personally a thorough believer in the Gold Coast mines, and my conviction of their value is shared by Capt. Burton, who has stated that the soil of one concession visited by him is eminently auriferous. In a private letter he has said that he "has seen or heard nothing to shake my belief in their magnificent future." Later, after seeing more of the country, he has become quite enthusiastic, saying that "it is California over again," and has urged greater energy in working the various mines. Commander Cameron had the curiosity to pan some "swish" prepared for plastering the walls of native huts, which showed bright spangles of gold. I found the soil everywhere impregnated with gold.

I must apologise for occupying so much of your valuable space; but as there is really so much misconception and ignorance in the public mind regarding Western Africa in general, and the Gold Coast mines in particular, I will, in conclusion, as one having an exceptionally long and extensive acquaintance with the country, beg intending investors to pay no heed to those well-meaning alarmists who possess only a mere hearsay and very erroneous knowledge of Africa and its climate, but to listen to such competent authorities as Captains Burton and Cameron, and to those who, like myself, have spent the better part of their lives on the West Coast, and who neither dread its climate nor doubt its immense resources.

London, April 10. R. B. N. WALKER, F.R.G.S., F.R.C.I.

THE GOLD FIELDS OF INDIA.

SIR,—It surprised and likewise amused me very much on reading the letter written by Captain Bray, in last week's Journal. He surmises that I was writing under coercion when I sent my letter to the paper, but this I entirely repudiate, and treat with that contempt which it deserves. The reason, and only reason, in sending my few remarks was to state a decided opinion, after a thoroughly practical test, of the existence of lodes in the Colar gold field containing gold in paying quantities, and of which the public will at no distant date receive ample confirmatory evidence. I also notice some mysterious allusion as to my having had a rap over the knuckles. Candidly speaking I am completely in the dark concerning this, and if Capt. Bray will tell me when and by whom the rap was administered he will do me a very great favour. Perfect harmony existed between the directors and myself during the whole of my stay at the mines.

Capt. Bray states that the stamps were in operation a month before his departure from the field, and how long after he does not know. So for his and the information of others, I would state that the stamps at the Mysore Gold Mines only worked three weeks, and during that time from four to five hours per day, consequently the number of tons reported to be stamped is not correct. The Madras Mail somehow got hold of information which was totally inaccurate. The reason why the stamps were not kept at work longer is very easily shown. The coolies had to carry all the water which was required for crushing purposes in chatties, and I venture to say that no one would continue working in such a manner for any length of time. We worked the Elephant stamps to prove their adaptability to gold quartz crushing, and to the best of our ability remedy any possible fault which might be found.

The quartz crushed was of the very poorest quality, but still gold-producing. I was unfortunately leaving the mines before we could work the blanket sand in the new amalgamating mill. If I could by any means have had Moses' rod, the crushing would have been carried on uninterruptedly on quartz of 6 dwts. and far richer; then very probably an ingot of gold large enough would have been produced capable of damaging any ordinary head.

Capt. Bray reminds me that I had previously written about five lodes being found on the property, and that only three were mentioned in my letter. Perhaps he will allow me to say that there are five and more lodes to be seen in the Mysore Company's property, but I thought the number three would be quite sufficient. As to the quantity of prospecting done in a new field, I fancy that no one would think it too much, as it was the only way to arrive at the true state of things. The future will tell its own tale, and taking time by the forelock, I again say I firmly believe that profitable mines will be opened out. I regret that I did not make the average of 8 ft. wide more explicit, but I will endeavour to do so now. In some shafts the lode was over 20 ft. wide, solid quartz, and Capt. Bray will recollect my asking him to come over and see it. The answer I had was that he and Mr. Marsh would do so. I am only very sorry they did not come. Many of the others did, and were highly pleased with what they saw. Again, Capt. Bray says if these lodes are as large as they are represented te be I should have raised something like 600 tons. That is perfectly true, and I will say that over 1000 tons of quartz is on the surface ready to crush.

Capt. Bray tells me that I have called the rock "Trap," and at other times "Basaltic." Experience serves me here; many of the basaltic rocks have been found to exist in steps forming a succession of terraces, resulting from the way in which they were thrown out upon the surface, and have received the name of "Trap" from the Swedish word "Trappa." They present themselves under various aspects in beds, veins, and dykes of all degrees of magnitude, and in such formation a great many kinds of minerals are found. I will name a few—viz., hornblende, angili, silver, and gold.

The dyke caused the lode in the Mysore mines to be thrown some 16 ft., but afterwards, I am pleased to say, it resumed its size and bearing, and the quality much richer. I can mention the names of the captains who went underground and inspected it if it is required.—*Truro, April* 13. JOHN M. ROGERS,
Late Manager Mysore Gold Mining Company (Limited).

INVENTIVE DIAMOND HISTORIANS.

SIR,—There have been several curious, not to say improbable stories published in connection with the early discovery of gold in South Africa, but I now subjoin one for the information of the readers of the *Mining Journal*, which, I think, surpasses everything I have previously read. It is in the first place declared that there is increasing evidence that South Africa may yet prove an El Dorado, and it is added that already the prosperity of the colonies there has been largely influenced by the Kimberley diamond mines, and we have lately had occasion to call attention to the active and apparently practical revival of interest in the gold deposits in that region. A prospect of a further extensive discovery of diamonds has now presented itself. On the authority of the Civil Commissioner of Clanwilliam and Messrs. Twentyman and Co., of Cape-town, the Cape Times reports the discovery of a very large diamond (24½ carats) somewhere in the vicinity of the Orange River. The fact that the exact locality where it was picked up is said to be now not known is considered to remove all suspicion of diamond "salting."

It appears that Mr. Cornelius Genis, a farmer of small resources living at Troe Troe, near Clanwilliam, has, like many other people in this country as well as in South Africa, a habit of picking up any stones whose peculiarity or prettiness attracts his attention. These he has hitherto kept in a bag in his clothes box. Mr. Genis is married, and a few weeks ago his wife, while rummaging through her husband's wardrobe, came across this bag—an article which, with that want of reverence for her husband's hobbies which is also not peculiar to South Africa, she thought she might as well throw away. A European who happened to be near at the time, however, suggested that it would be worth while to see if there were any diamonds amongst the stones. Trying to smash the stones is the test in vogue in South Africa; indeed, it is on record that the Kimberley mines were discovered by a farmer who placed a diamond under a bullock wagon wheel and ultimately received a large sum for the fragments.

Most of the lithological collection of Mr. Genis was, we are told, smashed to pieces in his absence by means of a hammer, but one particular pebble resisted all such attempts. When Mr. Genis himself returned home he was dutifully told of what had taken place, and he determined to try his own strength upon the stone with an axe; but even this method failed. The circumstance was talked about, and eventually came to the knowledge of the Civil Commissioner, with the result that the stone was forwarded to Messrs. Twentyman and Co., who found it to be a diamond of the size already indicated. Mr. Genis has described the route he took during the journey when he picked it up, and no doubt careful search for other diamonds will be made, as the evidence of the Civil Commissioner is regarded as strong proof of the truth of the story. If it should be urged against Mrs. Genis that by her sweeping procedure she very nearly risked the loss of a fortune for her husband, she would doubtless reply that had it not been for her the diamond might have lain hidden in the clothes-box for ever.

Now, the amusing part of this extraordinary narrative is that the diamond is about as easily broken as many very much less valuable stones, and that so far from there being any grounds for the old belief that a diamond can be hammered on an anvil without injury, the treatment of a diamond worth 10,000*l.* would in less than two minutes reduce it to fragments which in the aggregate would not sell for 100*l.* Any readers of the Journal then who have the good fortune to possess large diamonds should be careful not to deteriorate them between— HAMMER AND ANVIL.

April 5.

THE OOREGUM MINE.

SIR,—There are two letters in recent issues of the Journal which attract my attention. One is your correspondent, "Quid Rides," who speaks of the meeting of the Ooregum directors not coming off until May next instead of in February. I do hope his surmise may be wrong. This delay may be of importance to the directors, but it is most undesirable and decidedly to the disadvantage of shareholders. The non-submission of the annual accounts with the very unsatisfactory report just issued enhances the anoyance. I was anxious that we should have the earliest explanation of the blameworthy conduct of the directors in not having the erection of the crushing mill expedited, if it were only to have the 2000 tons of quartz on the ground turned into gold. Apart from the desirability of having this 8000*l.* in hand it is imperatively necessary that some of the assurances given in the prospectus, and again by Sir W. Arbuthnot on Feb. 23, 1881—*vide* your Journal of 26th idem—should be verified. The realisation of that assurance has been all along and is still within our grasp, and I would urge, nay entreat, my co-shareholders to take immediate measures to enforce this verification. If these 2000 tons yield what has been assured to us they will give it will enhance the value of our shares materially. If the assurance is found to be false it is certainly desirable that we should know our position at the earliest moment for reasons apparent. The postponement of the meeting until May would be further inexpressibly disappointing and annoying, inasmuch as Sir W. Arbuthnot would not be Chairman, who promised us last year such satisfactory results. His remarks still ring in my ears—that "the 40 ounces of gold from 44 tons was not selected quartz, and that it represented the value of the 2000 tons on the ground, that he had the fullest confidence in the success of the mine or he would not have become a director, and that he had recommended his friends to invest in it." I repeat it would have been highly satisfactory to have heard this year from Sir W. Arbuthnot's own lips his present view and opinion of the mine, but his return to Madras will prevent this should the meeting have been postponed.

I approve cordially of the remarks of your other correspondent, "Justitia," that the proof the genuineness of the mines generally is the assurances of the promoters, and the risk they run if the accounts given us by the mining experts have been cooked up for the British market, and I equally approve and endorse his suggestion as to the remedy left to us should falsity have attended the promoting of these mines. The Ooregum Mine was placed on the market with the assurance that it is traversed by five auriferous reefs, uninterrupted by faults, that one shaft can work three reefs (Vazie Simons says it can work five reefs), and that the lodes are indubitably true fissure veins; and that assurance has been re-assured to us by the representations of the production of gold from some of those reefs on four different occasions. The first production of gold was I believe in 1877, when 17 tons gave 40½ ozs. The second yield was I think by Munday, his 9 tons giving 3 ozs. to the ton. Following these two results General Beresford sent some quartz to Australia for assay, the result being 28 ozs. 14 dwts. per ton. And lastly comes the yield of 40 ozs. from 44 tons, that result being from unselected quartz then and still waiting crushing. That fourth result was declared by Sir W. Arbuthnot, at an extraordinary general meeting in May last—*vide* your Journal June 4, 1881—and it is very important to note that that result was obtained by General Beresford in December, 1880, that was after the mine had been started. I hold that these assurances given to us by the concessionaires with these declared results of gold from the mine should make it a most valuable property, and that if the directors had seen to its proper working since December, 1880, its shares would never have fallen to their present value, unless indeed the assurances of the concessionaires are not or supposed not to be trustworthy. The date of taking over this mine from the old company is July 1, 1880. The date of issue is October, 28, 1880.

Now what have the prospectus and the directors led us to expect of its working? They have told us that the main object of the proprietors (those of the old mine) is to secure ample capital to develope the mine, that they may sooner participate in the very large profits. Again, the prospectus expresses the hope of a dividend at an early date, and on Feb. 23, 1881—*vide Mining Journal* 26th idem—Sir W. Arbuthnot told us that a portion of the machinery, 20 stamp-heads with stone-breaker, was then on the way, and would be on the ground within 24 hours after arrival. That would bring us to April 1881, and the machinery is not yet up, even though the 8000*l.* worth of quartz has been waiting to be crushed since December, 1880. Surely this strange delay calls for explanation! Either there is no quartz on the ground, or if there be it is rubbish, and the day of reckoning is thus postponed.

It is unaccountable, nay inexpressibly singular, not only that no gold has been produced since December 1880, but that the reefs which produced the three first results have not yet been traced. If reliable information is not furnished by the directors within a reasonable time I earnestly entreat my co-shareholders that the most competently practical gold mining engineer be sent out to inspect thoroughly the mine, with the view of ascertaining if the assurances given by the concessionaires of this property are true; if true with whom rests the defective management of the mine, and whether the quartz on the ground is true in quantity and in its richness as represented to the shareholders. This action must be taken in England, and I believe any co-shareholder there will be supported by every Indian shareholder in their attempt to prove either that the concessionaires have dealt honestly with us or that they have cheated us.

Madras, March 19. INDIAN SHAREHOLDER.

MINERAL VEINS—SCIENTIFIC ACCOUNT OF HOW THEY ARE FOUND AND FILLED.

SIR,—It is stated that the theory of sedimentary precipitation in water is the one adopted by Weiser. This theory is that all mineral in the gold, silver, copper, zinc, lead, iron, and all other metals were in some remote period in a state of solution. The theory, the reasoning of which we are condensing from the Professor's communication, is based upon certain facts:—First, as is well known, the water of the sea now holds in solution more gold and silver than are found on dry land. Prof. Smith, of the London University, says that every ton of water on the globe contains from 1 gr. to 2 grs. of gold. Now, when the crust of the earth was very thin, and the heat of the internal fires very great, and the seas and lakes perhaps in a boiling condition, the minerals were held in solution by the water. As the cooling process went on these were deposited, together with calcite, felsite, quartzite, spar, and other gangue material at the bottom of ponds, lakes, and seas, reduced to oxides, carbonates, sulphurets, &c., by natural chemical processes, and afterward brought to a metallic state by heat. The dry land upheavals were going on during long ages. The various deposits took place not simultaneously but gradually, and at different periods. When the metamorphic age poured the melted rock material out of the drained lakes and seas metallic veins were formed, and their contents covered up often hundreds of feet under solid rocks. Then the pent-up fires of the interior earth broke through the thicker crust, and threw up the mountain ranges just as we see them to-day, with their veins of gold, silver, and other metals. The depth of the

vein will be graduated by the extent and depth of the lakes or seas in which they were formed. This accounts for the fact that all true fissure veins must have rocks of different kinds on different sides. If the fissures had been made by shrinking of the rocks in cooling the rock would, of course, be the same on both sides of the vein.

This is a brief analysis of the aqueous theory which is given to aid in forming correct theories, and with them correct methods of observation in both the discovery and working of mines.

Beverley, April 10. CORRESPONDENT.

BRAZILIAN MINING, AND THE SLAVE QUESTION.

SIR,—Following up the subject which I communicated to the Journal in November last, I beg to forward the translation of an article which was published in the Journal de Commercio of Rio Janeiro of Feb. 8. The directors of the St. John del Rey Company published in London a memorandum regarding the Catta Branca slave question, which appeared translated in the Jornal de Commercio with footnotes. It seems but right that the shareholders of the St. John del Rey Company should learn how much importance is attached in Brazil to the document issued by their managing director, and the manner in which it is dissected and commented upon. It remains to remark that the article signed "John Hockin, Director," appears in the following, translated back from the Portuguese, and may not be the exact wording of the original, R. WENDEBORN.

Ouro Preto, March 1.

[Translated from the "Journal de Commercio," of Rio de Janeiro, Feb. 8, 1882.]

THE SLAVES OF THE CATTA BRANCA COMPANY AND THE ENGLISH COMPANY—ST. JOHN DEL REY.

In November last year the latter company published in London a pamphlet with the evident purpose to elude the inexorable and wise English law, as well as the distinct prescription of the Brazilian criminal code, which threatened with criminal punishment the St. John del Rey Company for having most inconsiderately and in a revolting cynical manner matriculated as slaves persons that were free. We refer to the Catta Branca slaves, who, by a solemn contract and public deed, were designed to enjoy freedom ever since 1859. We publish in the following a literal translation of this pamphlet in order that the tribunals of the country and the Government of her Britannic Majesty, as well as the public in general, may appreciate the irregular and criminal proceeding of the St. John del Rey Company, who preserved in slavery people that should have been declared free, who stepped in as arbitrators of the destiny of the slaves of Catta Branca in violation of the laws of the empire and of England. In order that this insiduous, and we may say defying, pamphlet may be more easily understood, it will be accompanied by our notes, to which we call the attention of the reader.

The wicked case of the St. John del Rey Company is lost both before the tribunals and the general public. As the ex-slaves of Catta Branca were free by contract, as in fact they are now considered so by legal sentence, ever since 1859, no comments are needed regarding the wonderful pretension that the freeing of so great a number of slaves would have been a calamity to the population of the place and a demoralisation of other slaves, and that for such reason it was right to retain them in slavery and under the sole control of the St. John del Rey. The people of the St. John del Rey could not alter under any circumstances the law of the Brazils, and they will not escape by subterfuges as those of which the pamphlet is made up the healthy rigour of the English law. There is no escaping the verdict which hangs over them—they will have to submit. The fact of having knowingly and with a purpose retained in slavery free people must bring upon the authors the legal consequences. A manifest violation has been committed against the legislation of the two countries, and such violation will have to be punished without fail. This, now, is the pamphlet:—

Memorandum respecting the contract between the Brazilian Company (Catta Branca) and the St. John del Rey Company, and the renewal of same:—

About three years before the contract expired (1) the directors of the two companies invited the opinion of all their principal employees, among them a late superintendent of the Catta Branca Company, and also that of their friends amongst the large Brazilian proprietors, respecting the convenience of a sudden emancipation of so great a number as 300 slaves, altogether unaccustomed and incapable of becoming good citizens in consequence of their habits, wanting sobriety and industry. In the interest of the slaves in question there was heard the opinion of those employees who knew them individually, and also the opinion of the local proprietors, in order that the latter as well as the Government might take proper steps in the event of such measures becoming necessary. Among the various persons who were consulted on the spot, or informed of the pending question, there was but one unanimous opinion (2) that such a measure would be prejudicial to the well-being of the slaves in question, who it is well known would give themselves up to intemperance and licentiousness (3) as being their habits, and would in all probability cause serious discontent among the slaves of the neighbourhood, if not an insurrection.

For some time previous it had been tried at Morro Velho with good results to base the claim for emancipation on good conduct and love for work (4).—As a recompense for good conduct, the Morro Velho Company freed gratuitously during that time a considerable number of slaves with happy results, and, as said before, every person asked was of opinion that it would mean prosperity to all persons concerned if the sudden and simultaneous emancipation of so large a number was substituted by a gradual one in that form (5).—This is also the wise principle on which the Brazilian law of emancipation is based, and which has operated with such beneficent results since 1870, contrasting happily with the effect produced in other countries by sudden emancipation (6).

Not the slightest doubt existed that the contracting parties had the power of making an alteration to that effect. The opinion was given by eminent lawyers in London that the parties who made the first contract had ample authority to modify it, as they were the only parties to it. A similar opinion was given by the company's lawyer in Minas (7).—It should be remembered that a great change has taken place in the feeling and public opinion in Brazil within the last 24 years in matters concerning slavery. In 1857, when this subject was little considered, not a single voice would have been heard that advocated a measure so unpopular. Nobody thought of the emancipation of slaves (8).

The company of Moro Vilho alone had adopted a system of gratuitous emancipation of their slaves. It should also be remembered that the Morro Velho Company anticipated by two years the benevolent act of the Legislature by giving freedom to their new-born slave children. All the children born of their slaves since the 1st of July, 1868, were absolutely free, without the condition of serving 21 years, as the Brazilian law of emancipation imposes (9).—From the consideration set forth in favour of the well being of their slaves, from the pecuniary loss which the Morro Velho Company was sustaining by the transformation of their captives into free and diligent labourers, it may certainly be concluded that whatever influence was brought to bear on the masters of the Catte Branca negroes, it was entirely with a view to the well being of those slaves (10). The Morro Velho Company, as the employers, had no further interest in the matter, because they had no power for granting emancipation if such was not given them by the masters of the slaves. It was given them by a contract, and they acted upon it to the extent of their authority, freeing with their own slaves those of Catta Branca, one by one. No less than 88 slaves were emancipated up to 1878 (11).

Boldly we state that never for a moment pecuniary consideration weighed with the Morro Velho Company when the well-being of the negroes was concerned, and this follows conclusively from the fact that within the last 35 years they have, under great pecuniary sacrifices pushed forward the system of gratuitons emancipation of their slaves, and presented up to that date not less than 168 slaves as emancipated, not counting the children born since 1868, and that within a few months they will have ceased to possess slaves, as all will have been emancipated. The company challenge an instance of a similar sacrifice by any individual or company in freeing so great a number of slaves, having, as they had, urgent necessity of their services (12). The truth is that by the judicious manner in which emancipation was granted the emancipated became for the most part industrious labourers, and proved a real gain to the country, while their services would have been totally lost by indiscriminate emancipation. The pecuniary sacrifice, however, was not the less.

It remains to note that it has been stated in public letters by persons interested that the Brazilian Company (Cetta Branca) had ceased to exist. The best reply to such an assertion is that when, by the law of emancipation of 1870, it became requisite to matriculate these slaves; they were registered as the property of the Brazilian Company by the then superintendent of the company (St. John del Rey), who at the time occupied also the position of English Vice-Consul in Minas Geraes, and who had for this purpose a power of attorney from the directors of the Brazilian Company (Catta Branca) dated Aug. 6, 1872 (13).—Other powers of attorney of the directors of the Brazilian Company (Catta Branca) were registered in Brazil, among it one dated June 23, 1880. Besides this, there are the receipts for the wages paid regularly for each six months by the St. John del Rey Company to the Brazilian Company in the possession of the tribunals of Brazil. And it can further be legally proved that the said wages, acknowledged by receipts, were regularly paid by the St. John del Rey Company in half-yearly dividends to the shareholders of the Brazilian Company (Catta Branca) (14). JOHN HOCKIN, Director.

(1) Not correct; this "apocryphal" memorandum, filed with the papers (autos), Cl. 136, was fabricated on July 21, 1877, after the action for freedom had been commenced since June 11 of the same year. It is craftily legalised by a celebrated, but fossil, director of the late Catta Branca Company.

(2) If this were true, which has to be proved yet, this unanimious opinion would not have authorised the Morro Velho Company to break a contract got up and published in regular form, by which the slaves acquired the right of freedom when the time of their hired service expired. The idea ("coarctada") is not a bad one. The St. John del Rey Company heard what they liked, save any Brazilian or English authority on the subject, and then decided on a terrible aloeration of the civil right, and all this because it was not convenient for them to abide by the principle of right. The confession of their deliberation and the subsequent execution is ample proof to condemn them.

(3.) Oh, how much foresight! If that were so, from England to the end of the globe intemperance would make millions of slaves. Who authorised the St. John del Rey Company to come forward and moralise between us and against stipulated right? It was the company that practised immorality by arbitrarily retaining in slavery people that were free. This exposition of moral feeling on the part of the company is but a stratagem for usurping the services of the unhappy souls who were so unreasonably treated by them.

(4.) The St. John del Rey Company thus gave the basis of the emancipation of slaves, of course in their fashion. And what is still better, they deliberated and decreed at their best understanding. Englishmen holding slaves, thus violating the law of their own country, giving lessons for emancipation. It is interesting.

(5.) Why then did the company not execute their humane deliberation by freeing yearly at least 5 per cent. of their *protegées*, when all would have been freed after 20 years, and become good and moral workmen without the risk of an insurrection? Why did they only free 88 in the course of 20 years, including the 32 who were freed after the case was publicly discussed and already in the hands of the magistrate to be judged? Well, will any one in good faith say that they were in earnest with such confessions? Out of 385 slaves, and their large descendants, they freed 88 during 20 years! No further comment is needed. The *protegées* of the company realised their claim to freedom only by death.

(6.) Here we have the English company, St. John del Rey, intruding on the economical politics of Brazil, and—don't wonder reader—legislating from their high position as masters of free people. It is mockery!

(7.) Famous jurisprudence! In such a manner any obligation may be evaded, seeing that there are lawyers who have a remedy for everything. In the excitement of the subtle defence the writer of the pamphlet forgot that by the contract they created rights to third parties, and these, once acquired, could not be cancelled. He further forgot that part of the public deed which conferred freedom on the slaves would, after the lapse of a certain time, acquire the value of a "carta de liberdade," and this once conceded is irrevocable.

(8.) Manifest falsehood! The idea of the emancipation of the slaves dates from the independence of the Empire. Honour be to the province of Minas, that it always fostered the idea of substituting slave labour by free one. And a company, St. John del Rey, comes forward to "edificar o nosso espirito" (edify our minds) by their example. On the contrary, they bought, hired, and possessed slaves for their proper material interest, and what is worse they kept in slavery free people for the glory of their philanthropy!

(9.) Happy thought! Our wise law of the 28th of September, 1870, had its cradle in Morro Velho, and with the company St. John del Rey. It was the invention of that very wise body of English miners. So much so that they established matters in a more perfect sense than was done by the law. That is what it is! Only now we hear of this great discovery. But, surely, the pamphlet is not in earnest.

(10.) "Oh! Caridane evangelida!" To keep in slavery free persons in order that they may be turned into free and diligent labourers—after death.

(11.) There were 385; if we take the increase within 20 years as 50 per cent., corresponding to a yearly one of 3 per cent., there would have been 616. A freeing of 88 in 20 years corresponds to 15 per cent.; therefore, in this progressive march the whole would have been freed in the short space of 120 years if kind death had not freed them before, as it did, reducing that great number to 163, who still enjoyed the sweetness of the protection of the company when the action for freedom was commenced.

(12.) Not one instance only but many. The priest, "Joao Marques Guimaraes de Jequitibá, Municipio de sete Lagoas," freed all at once, and without onus, 300 slaves, confirmed by public records. Antonio Moreira Barboza of San Quiteria, district of Sabar, freed likewise 80 slaves. The Bishop of Marianna freed all his slaves of the "Recolhimente de Macaubar," more than 100, by a single stoke of the pen. Antonio de Rocha Diniz, of San Quiteria, freed all the slaves he possessed without inconvenience to the public, and without their getting lost. This is reference to this district. The number of slaves freed by the Crown and convents run up to many thousands, therefore the celebrated philanthropy of the Morro Velho Company will come out very patent.

(13.) The free blacks were matriculated on April 29, 1872, as per document, for 56, 57, and 64, while the power of attorney in question is dated Aug. 3, that is three months and seven days later. It is an insult to the British Government to attribute to their Vice-Consul a criminal act—he represented his Government that holds no slaves.

(14.) These services were extorted during 20 years, and among the papers "autos," there exist only three half-yearly receipts without authenticity, but signed by individuals who pretend to be directors; notwithstanding, it is alleged that the payment had been made to the shareholders. Respecting the existence of the Catta Branca Company, it is sufficient to consult the documents signed by the directors of Morro Velho, folio 106 and 105, in which there is mentioned repeatedly—the extinct Catta Branca Company. Well, if it existed it could not be extinct; if it was extinct it could not exist. How many subterfuges, how many untruths, mystifications, contradictions, and artifices!

VICTORINE GOLD MINING COMPANY.

SIR,—On Feb. 10 this company's mill, as we were informed, "was running splendidly;" but from that time to the present we have had no report of the result. It would be interesting to know whether the Mears' process of chlorination is an established success, or only partially, or not at all. The general impression is that the mine and mill are a complete fiasco. Perhaps the directors will kindly throw some light upon the subject by issuing a detailed report of the work done and the result for the past six weeks, and also whether it is true they have reason to change managers. W. B. D.

Victoria Park-road, April 11.

RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—The directors of this mine have intimated their intention to appeal against the decision of the Carson District Court, which have been given on all points in dispute against the Richmond and in favour of the Albion Company, and the verdict is stated to have been unanimous. Under these circumstances the result of the appeal may be foreshadowed. Instead of prolonging this litigation I think the directors of the Richmond Mine, in pursuance of the powers given them in the Articles of Association to purchase adjoining properties, would act wisely in buying up the Albion Mine on behalf of the Richmond Company. The present value of Albion shares is between $2 and $2½ each, and I notice in the reports of the San Francisco Share Market that thousands of these shares change hands daily at about the medium between the prices named. I, therefore, suggest to the directors of the Richmond to send instructions at once to Mr. Probert to buy up all the shares he can obtain at from $2 to $2½ each, as it is expected that when the decision of the Carson Court is confirmed by the final Court of Appeal the shares will rise to at least $10 each. An amalgamation between the two companies sooner or later is inevitable, as the ground between them is reported to be caving in, and it will soon "Cap a Philadelphia Lawyer" to decide which is Richmond and which Albion ore. The directors of the Richmond are well aware that ore is visible in the disputed ground, as in their last report they account for the falling off in the returns of their own mine by the fact of the injunction preventing their taking ore from this part of the mine in which it is known to exist. Unless some step of this kind is taken the shareholders may be startled some fine morning by a telegraphic announcement from Samuel Longley, the newly appointed foreman, that the ore chambers no longer yield the quantity required to keep one furnace going, and that smelting must be suspended until new discoveries of ore are found in the lower levels. In the account of the explorations now going on there is a "damnable iteration" in the reports "of no change since last report," which simply means no fresh ore bodies discovered. Now I am of opinion that it would be far more profitable to expend our reserve fund of 75,000*l.* in buying ground in which abundant and rich ore is known to exist at the same levels at which the Richmond Mine was so profitable, than to continue running drifts at a depth below that at which deposits of value have ever been found in any other mine on Ruby Hill. I am not going to say one word against the directors of the Richmond Company. They have managed the property in a manner to deserve the gratitude of the shareholders, and they are men of high standing and unblemished reputation, but there is one part of their policy which I cannot endorse. I refer to their pertinacity in holding large stocks of lead. Upon these stocks it appears to me that the shareholders have to pay interest to the bankers or agents of the company. A short time ago the stock of lead was not less than 10,000 tons, representing a money value approaching 200,000*l.* The interest lost on such a sum as this must be very large, and can scarcely have been recouped by the slight advance in price which took place last year, and which has since been lost. The lead as well as the gold and silver should be realised as soon after they are smelted as circumstances will admit, and I hope that in future the directors will adopt the course which I venture to recommend. I must not close this letter without mentioning that the Albion Company has recently made a call on its shareholders of 30 cents, about 1s. 6d. per share, and any buyers of shares would have the call to pay in addition to the quoted price. As my motive for recommending the purchase of Albion shares may otherwise be misunderstood, I may mention that I do not hold and never have held an Albion share, and my only object is to promote the interests of the Richmond Company. I enclose paragraphs from the Eureka Leader, in which the decision of the Carson Court is referred to, and also a paragraph refering to a recent fall in the price of lead, and I think they will strengthen the views which I have advocated in this letter. The Eureka Leader says—"A fall has taken place in the price of lead from 5½ to 5 cents. per pound; 500 tons of Richmond have been sold by a speculator at the latter price, and buyers now only offer 4 9-10ths."

THE ALBION WINS ALL POINTS—THE DECISION OF THE SUPREME COURT.—A despatch received from the Clerk of the Supreme Court at Carson says:—"Every point decided in favour of the Albion by a full bench. Albion takes all ground west of the line K. L. Injunction against the Richmond now perpetual." There are two suits still pending in our District Court for this same ground, but which have been continued until the next term of Court, injunctions pending in both. The injunctions can be heard without trying the cases on their merits, and these injunctions will be heard on April 10. The decision of the Supreme Court making the injunction against the Richmond perpetual is conclusive of the cases now pending, and the two injunctions must necessarily be dissolved. This will enable the Albion to take out the ore after that date. The only title the Supreme Court would likely pass upon in this case would be the Victoria, because every other title was decided against the Richmond by Judge Rives, and the latter company did not appeal. So the gist of this decision is that the Victoria patent is void as against the Uncle Sam. Judge Rives gave 572 ft. of disputed ground in the Uncle Sam to the Richmond, this ground containing the ore bodies that had been discovered. The Supreme Court reverses this decision, save as regards a small portion between two certain lines.

S. H.

MINING IN SOUTH AUSTRALIA.

SIR,—A variety of circumstances have prevented me from writing so frequently of late as I intended, though there is not much of special importance to report beyond general satisfactory progress in relation to mining matters in this colony. Most gratifying and profitable returns were obtained from the first crushing of stone from the Bird-in-Hand Gold Reef, 23 miles East of Adelaide. The quantity crushed was 280 tons, and the result was 416 ozs. of refined gold, worth 1640*l.* The crushing occupied four weeks, and the stone was raised with ease and rapidity from the surface and downwards to a depth of about 60 ft. The reef is a mixture of quartz and ironstone, and gold may easily be seen in it without a glass. The reef averages about 3 ft. 6 in. in thickness, and is at present rather flat, (say) dipping about 3 ft. in the fathom, but as the sinking goes down it shows signs of becoming more vertical. The country is easy, consisting of decomposed feringinous clay-slate and sandstone. From the length of reef already exposed and the amount of exploring done it may be safely affirmed that there are several thousands of tons of stone in all probability equally rich with that crushed. The district for miles around is more or less auriferous, and the work of prospecting is going on. A few miles to the north-east, near Blumberg and on to Mount Pleasant, several important discoveries have been made, and it is probable that as one after another proves payable gold mining in South Australia will become as well established and important an industry as copper mining has been. In the case of the Bird-in-Hand stone there is so much iron pyrites that a large proportion of the gold is lost, as assays of the tailings have proved. It is not the fault of the machinery, but of the pyrites and black sand mixed in the stone. The machinery is very good and works well. The present summer has been one of the driest ever experienced in the colony, which in many districts operates very much against gold mining. At Waukaringa especially, always a very dry country, operations have been nearly suspended on account of the want of water even for drinking. A crushing of 70 tons of stone from the Alma Reef was made with some difficulty, and the result was about 82 ozs. of gold. Several gold claims, many of which have shown very good prospects, are being worked on the old Echunga diggings, and for three or four miles round machinery is being erected on the leasehold (Government land) property of the Echunga Gold Mine, and a quantity of rich stuff is ready to be put through the battery as soon as a sufficient supply of water is secured. A discovery of auriferous quartz giving 1½ oz. of gold to the ton, together with stream tin of 35 per cent., has recently been made public. I alluded to it in a former letter as being in the hills about 12 miles east of the city.

The old Lady Alice Mine, 12 miles from Gawler, has just been got once more into working order, and some good stone has been found in driving from the underlay shaft at a depth of about 380 ft. (on the incline). It is intended to work this mine with energy and judgment, and it is believed it will prove to be a very payable property. Other gold discoveries known only to a few persons are being kept in abeyance for a time, as the market has been rather overdone with companies for a time. I have succeeded in disposing of the silver-lead mine near Glen Osmond, formerly worked by an English proprietary as the Wheal Watkins. It has been taken up by a Melbourne company. This was mentioned in a former letter which you published from me.

The Moonta, after a cessation of dividends for about three years, has just declared one of 10s. per share. The mine is looking as well as ever, and is turning out large quantities of ore. Our mineral exports last year, almost entirely copper and copper ore, amounted in value to 415,796*l.*, only about half what they reached some years ago, but 69,649*l.* more than those of 1880. Some new discoveries of copper are announced, and if a rise to 75*l.* should take place we shall see a great revival in copper mining here. J. B. AUSTIN.

Adelaide, March 4.

WHENCE SHALL WE OBTAIN NEW GOLD?—No. II.

SIR,—In a previous letter I showed the stocks of gold coins and bullion in the Western World at the period of the discovery of America, the total production and consumption of gold in the arts since that date, and the stock of gold in coins and bullion available for coinage at the present time. I showed that this stock (about 310,000,000*l.*) was held chiefly by four powerful nations, to whose imperative requirements for gold all the other nations had surrendered their coinages, and resorted to paper money systems. It was then shown that, notwithstanding this centralisation of gold, the growth of population and commerce, employing gold coins for money, had been so rapid that the stock even in these four countries was in, sufficient, and that a vast system of representative silver and copper coins and bank notes had been erected upon the gold basis, and that unless this basis was maintained a grave danger threatened society, that the maintenance of this basis depended upon new supplies of gold, and that these supplies had diminished, and threatened to become still further diminished. The cause of this diminution was traced to the nature and history of gold mining. It was shown that gold is produced primary from quartz and secondary, but chiefly from placers; that all the important gold quartz mines discovered since the era of free mining in 1848 had been measuredly exhausted by forced labour, which cost little or nothing; and that of those discovered since 1848, the only ones which, with few exceptions, had proved both profitable and permanent, were in Western America and Australia. It was shown that all the important placers, except perhaps those of Brazil, which had been worked previous to 1848, had been quite exhausted, and that of those discovered since 1848 only those of California and Australia, with some few isolated exceptions, could be depended upon for large future supplies. This review substantially narrowed the sources of important and certain supplies of new gold to Western America (chiefly California) and to Australia, the supplies from Russia being regarded as of undefined quantity in consequence of the unreliability of Russian statistics on the subject. Finally the latter promised in future to show whence the commercial world must look for further supplies of this precious metal, and from what countries it is futile to look for them. It will help to simplify matters if I commence with the latter.

I regard it as futile to look for any important supplies from India. The country is an old one; its gold placers have been long since exhausted, and its gold quartz reefs were most thoroughly explored by the ancients, and to depths which, except in Grass Valley, California, and a few other exceptional districts throughout the world, have usually proved to contain the richest deposits (mind, I am speaking of gold and not of silver or any other metal). The ignorance and physical defects of its inhabitants render it as impossible for India to compete with the New World in mining as in agriculture or manufactures. Workmen and overseers for mines have to be imported from Europe, America, or Australia, and at great expense both for salaries, travel, and keep.

The Coast of Africa is regarded as equally unpromising, not because its quartz mines are robbed of their richest treasures, as in India, but on account of the labour difficulty, which is similar to that in India, and also on account of the climate. There are possibly rich placers in the interior of Africa, but as yet none have been discovered. I recently visited a place on the West Coast where a rich placer was said to have been prospected. The sand was rich enough, but there was not a particle of water, nor no dump. It would be cheaper to buy the gold from the Bank of England than to mine for it in such a place.

There are but three or four important sources to which we must look for our future supplies of new gold. These are Western America (chiefly California), which produces about 6,500,000*l.* a year; Australasia (including New Zealand), which produces about 4,000,000*l.* a year; Russia, which is said to produce 5,000,000*l.* a year, but which probably does not produce more than half that amount, and Brazil The rest are unimportant, not as mines, but as gold mining districts

With regard to California and Australia, the yield is decreasing. A large proportion of the product of gold in California comes from the hydraulic (placer) mines. Many of these mines tail into the affluents of navigable rivers or into valleys devoted to agriculture. Such is the immense damage done by this mining debris that active efiorts are being made by the agricultural and commercial classes to stop hydraulic mining, and these efforts must sooner or later succeed, so that the only hydraulic mines of the future will be those that can impound their own tailings, or those that tail into the deserts or other worthless lands. In Australia, owing to the low grade of the quartz, the mines are being gradually surrendered to Chinese labour, and this means inferior processes and diminished product.

With respect to Brazil as its resources of gold were said to be exceedingly gaeat, I resolved to examine the country very thoroughly, and accordingly I left London last year for Rio Janeiro, whence I proceeded to the mining regions. As the investigations made were extensive, I propose to reserve an account of Brazil for a future letter.

Grosvenor Hotel, London, April 13. ALEX. DEL MAR, M.E.

THE INDUCTIVE SCIENTIFIC MINERALOGICAL INSTITUTION v. THE RULE OF THUMB.

SIR,—In recent years we have had a diversity of improvements in almost every class of manufacture and calling—old practices done away with and new ones introduced, whose names are legion, but to the present the miner has been allowed to grope his way in darkness, notwithstanding the many proofs of a system in the mineral and inanimate kingdom as well as the animal and vegetable and animated kingdoms. We daily perceive proofs cropping up to prove that the three kingdoms are governed precisely alike, and having the first two as guides, the difficulty is removed in a great measure to prosecute successfully and satisfactorily the third.

The question has been asked again and again if we had not already a Miners Institution, &c.? My reply to such enquiring friends is we have, but how far have they proceeded in investigating our mineral lodes and veins they have not even glanced at the subject, and thus far their proceedings have been purely mechanical, and the mineral properties have been left out in the cold, and I beg to quote an instance in proof. Some time since a rich vein was discovered not far distant; on meeting with the manager I put the very reasonable question, What was the cause of the vein becoming rich? his reply was he did not know what made it rich, he had got it (the riches), that was quite enough for him to know, and that was really all he did know on the subject, and the question I put to him I am safe to state was never put to him before, and it was a subject I am persuaded had never cost him a thought, and a question I never heard of being put by anyone except myself, and when the subject becomes better understood it will be clearly seen that there must be a cause to produce an effect. So much for the rule of thumb.

But who is to be benefitted by this new Institution? For answer I will state all classes of society, from the prince to the peasant; the prince's mineral property will be developed with a greater amount of certainty, and the results more satisfactory; and with a greater amount of mineral returns for a less amount of outlay, a much greater capital will be invested in mining, giving full employment of labour for our miners and labourers, and which means better pay.

Facts are stubborn things, and, if possible, I prefer strengthening my assertions by one or more facts. The mine in which the above-named vein became rich was made so by the junction of a caunter with the east and west lode. This mine had been worked by a company about the year 1824, and after an outlay of thousands of pounds was abandoned; then, again, it was worked about the year 1834, and again abandoned with another heavy loss to adventurers when within 12 fathoms of the riches, as has been proved in recent working. My aim and object is to endeavour to persuade mine adventurers that there is no reason for such an amount of capital to be wasted and recklessly spent as in the case above named, as the set or mine had the elements in it to make a profitable and paying concern, and the parties interested must have had a high opinion of the ground, but light was required to point to the spot, and for want of knowledge a mine has been abandoned and shut up for over 58 years; during that time who can compute the amount lost to the lord or lords as dues, the amount that might have been paid to the miner and labourer, and which means so much money lost to the merchant, &c. "All very well, but I do not understand the subject," I get for answer from many, neither did Mr. Morse's supporters understand the electric telegraph when named to them, nor has it been less beneficial in consequence. Neither is it understood why a tree bears fruit agreeable and pleasant to the taste, and which we do not object to because we are ignorant on the subject, or are they less beneficial to humanity in consequence. My advice to all is when you find a tree bearing an abundance of fruit pleasing to the eye and agreeable to the pallate, such fruit, for instance, as the wire rope, nourish and support it, that it may be enabled to give better results in future, and not throw stones at it, as is the custom of boys.—*Hayle, April* 11. JAMES WILLIAMS.

VALUE OF MINES, MINING COMPANIES, AND THEIR FAILURES.

SIR,—When I entered upon and continued this discussion I did so out of pure regard to truth, justice, and the interest of the public, and I am pleased to say that my letters have had the desired effect upon the public mind. A writer, signing himself, "A Careful Examiner," has, however, introduced into the question gross abuse of privilege, personalities, untruthfulness, misrepresentation of the contents of my letters, and committed libel upon me. These objectionable elements are always avoided by those who are entitled to consideration as gentlemea, and whose aim is nothing else than honourable conduct in their mode of criticism. Under these circumstances, and for other reasons that will appear, I decline to discuss with "A Careful Examiner" such an important subject as that of the science and practice of valuing mines, or indeed any other question; and I do so for the reasons that—First, he is a mere novice in such matters, having never been instructed with a valuation, and actually knows nothing upon the question, but desires to draw me on to give rules and detailed valuations, so that he may learn how to use and apply them for his own purposes. Second, that he is a man of absolute untruth, not to be depended on, and is unworthy to receive notice from me, or from any other gentleman occupying the same position, professionally, scientifically, and practically, as I have the honour to enjoy. Third, that he is a person having no real knowledge as to the Monte Catini Mines, never having heard of them before the copy of the *Mining Journal* containing the prospectus reached him one fortnight after publication. Fourth, that he wrote "Cornwall" at the bottom of his first letter, for the purpose of misleading the public, and concealing the real place from whence he wrote, and also his identity; further evidence of this being that the name of no place has been attached to his succeeding letters; and, lastly, I object to be connected with him, because I have received information from a private, though I believe reliable source, that he is a "Welshman," and is now employed as an ordinary foreman over a few workers in iron at a small ironworks, from which remote place it takes a fortnight before this correspondent can write a letter to the Journal.

Were any responsible gentleman to come forward with a view of discussing this question in an honourable manner, and would sign his name and place of residence at the foot of his letters, I should be prepared to continue the discussion to any length it may be desired, and would sign my own name; but I shall not waste time and occupy space in your valuable Journal by noticing anything that "A Careful Examiner" may communicate to you. Assertions and assumptions, upon false grounds, prove nothing at all, but this is all this notorious twaddler has been able to bring before your readers. The little book, "Spon's Tables of Memoranda for Architects by Hurst," which this person always carries in his pocket, did not supply the amount of 1*l.* at 5 per cent. for 4½ years, and as your correspondent was not capable of calculating from first principles that it amounted to 24,886*l.*, he was compelled to state that the amount he wished to arrive at was "about 67,275*l.*" Now, in such a particular discussion as this, or any other scientificmatter, mathematicians, tutored engineers, and valuers never say "about." A question of figures is definite, and people only say "about" when they are uncertain in their minds as to the amount resulting from a computation made by "rule of thumb." Now, I proved that "A Careful Examiner" had committed a great error even in the matter of a simple multiplication, and after correcting a small error due to the printer or copy, I find that he was in error to the extent of 3689*l.* 10*s.* 7½*d.*, which this pretender, "A Careful Examiner," has not had the manliness or ability to correct, but passes it over by calling it a "slight error."

I will not descend to argue with a man of such evident mean stamp as "A Careful Examiner," but will content myself by drawing attention to another base act of this person towards the question, and myself. In the last paragraph of his letter, dated March 18, he invents a series of false numbers, which he calls values, and then endeavours to make it appear that I am responsible for them. In that paragraph he commenced by inventing a fictitious income of 18,750*l.* assumes 5 per cent. per annum profit,, copies a year's purchase of 11·4658 out of "Spon's Pocket Book," and writes down 214,983·75*l.* Although the whole of these numbers have been concocted for a paltry purpose of and by "A Careful Examiner," still with regard to them he says, "I ask 'Mining and Civil Engineer,' and also his friend 'Investor,' to reflect on the absurdity of these figures." It must be particularly observed that "A Careful Examiner" does not ask me and "Investor" to reflect on "the absurdity" of any of the particular figures which I have ever written down, but upon those which he himself has concocted and written down. Here we have a most ridiculous and laughable farce given to us for our amusement by this foreman, who calls himself "A Careful Examiner."

I now beg to thank you, Mr. Editor, for the space you have granted to me, and the public for the consideration I have received, and conclude by remarking that such apparent foolishness as that coming from "A Careful Examiner" could only be attributed to one who has become a fit subject for an asylum.

Santander, Spain, April 3. MINING AND CIVIL ENGINEER.

GELATINE

SIR,—Several accidents have occurred in Germany in consequence of the spontaneous combustion of gelatine. During 1880 four well secured magazines exploded, in which dynamite had been previously kept for many years with perfect safety.

1.—A magazine at the Rheinpreussen Colliery, near Hamburg.

2.—A magazine at the mines of the Actiengesellschaft für Bergbau Bile und Zinkfabrication at Aachen, near Ramsbeck.

3.—A magazine at Leimbach.

4.—A magazine belonging to Nobel's Company at Avigliani, Italy.

5.—During the construction of a tunnel between Erfurt and Retschenhausen, under Government supervision for the Government railway, several people were killed through using gelatine, in consequence of which orders were given that the whole lot should be destroyed, and that not another ounce should be used.

The whole of this gelatine was manufactured by Nobel, and consequent on these various accidents there is every reason to believe that gelatine, like badly manufactured dynamite, contains ingredients which cause spontaneous combustion, easily brought about by a change in ordinary daily temperature.

Gelatine must, therefore, be considered as a highly dangerous compound, especially if it is to be imported into hot countries. In consequence of these accidents the German Government will probably issue very strict regulations for carrying and using gelatine, while it is even stated that it may forbid its entire use and manufacture.

K.

MINING CRITICISM.

SIR,—Letters have recently appeared in the Journal from Mr. Robins on a mine in Devonshire, which seem to bear evidence of a greater amount of imagination than of real practical knowledge of mining. The idea that a champion lode of the size and quality he mentions remains neglected by any practical mine agent in the west is somewhat beyond ordinary belief, and is probably on a par with a recent statement by another correspondent that he could sink through ground in the same mine that Mr. Robins refers to with speed almost equal to that of a mole through a meadow, The representation of Mr. Robins that discoveries can be laid open, reserves secured, and dividends placed in view of the shareholders from an unexplored portion of the mine in about a quarter of a year also admits of some considerable degree of doubt OBSERVER.

April 12.

THE PRESENT ASPECT OF MINING.

SIR,—I am one of the unfortunate individuals who last year were induced by the illimitable promises contained in the numerous prospectuses of undertakings well known to your readers to invest in Cornish and Indian mines. Since that time I have, through the aid of the Journal, come to the conclusion that the statements in every prospectus I have seen were unwarrantable, and must have been well known by the framers to be exagerated and misleading, and in many instances which have been exposed grossly false. This being so it follows, I think naturally, that the laws governing the formation and management of Limited Liability companies are too lax and mild altogether. Again, it is absurd that companies should be brought out with a capital of 400,000*l.*, and then for the shares to be allotted if the applications are only perhaps for half the amount, and leaving a mere trifle after the purchase money is paid for working expenses, and which the directors or any sane man know will be totally inadequate. This is done frequently, as your paper shows. What is the shareholder's protection, and why should his money be sacrificed in such cases? Why do the directors allot when they ought not? The fact is now-a-days in these companies the shareholders are just the last people who are considered. First comes the vendor and promoter, who are sure of their haul; next the lord steps in for his dues; afterwards come the worthy directors with their 500*l.* and so forth a year; and, lastly, the poor deluded shareholders, who may reckon themselves very lucky if they see their money back again. Most of the companies started are not with a view to benefit the investors at all, but just for the purpose of paying directors, brokers, dealers, and speculators, who do not care a straw whether the undertaking prospers or not, and cannot promote the success of a mine at all, knowing nothing of mining. I should like to know for what reason these 500*l.* a year are paid to directors. For signing their names occasionally, and being present once or twice a year at the meetings, when they usually tell the shareholders they want more money for machinery, and they hope for a better price for ore. No matter what price the ore the royalties go on, the directors' fees go on, the smelters' unjust margin of profit goes on; but the dividend does not go on, and perhaps never will. If there was a practical business man appointed to manage and control the whole concern, devoting his whole time and attention to its affairs, I think it would be more satisfactory. The directors are allowed to have too much lattitude and power, and there is not the check on them there ought to be; in fact it would be an easy task for a board to ruin any property by neglect or otherwise before they could possibly be removed. The practice of having one or two meetings a year seems to me to be a mistake. Why should there not be four or six meetings a year, and questions put before the shareholders to decide?

There is another point I should like to know something of. It appears to be an old custom to sell copper ores, the produce of mines I am interested in, by a system called ticketing. I have noticed that the result of this has been unsatisfactory to the mine, not realising its actual value; in other words some thousands of pounds are being diverted in some unjustifiable way from the shareholders' pockets, just because some custom of the dark ages has been preserved which ought to have been swept away long ago, and some rational method substituted whereby the miners should have proper value for their produce. The royalty system, too, taxing the gross instead of the net profits, is to an impartial observer quite anomalous. Truly, the investors in mines have not much that they may be congratulated upon. What with royalties, directors' fees, losses by smelting, &c., they may prepare themselves to be extinguished by foreign countries which do not labour under these manifest disadvantages. Look at the Journal list of mines, and see how many have paid a good dividend for years together, and for one of such you will find 50 which have been actual loss to shareholders, benefiting no one but the vendors, dealers, brokers, promoters, directors, reporting captains, and others whose aim is to live at the expense of the public. I see these latter are called Progressive Mines. They are progressive certainly, but I fear in the wrong direction. Many of them will progress so fast that they will conclude by winding up and liquidation, which might be averted if there were not so many pulling against the shareholder and no one to pull with him. CRUSADER.

April 12.

PARYS MOUNTAIN COPPER COMPANY.

SIR,—With reference to the letter of "A Flash in the Pan," in last week's Journal, on this mine, permit me to inform him that gold has been found in every sample of ore sent for trial, and much confidence is placed in the results which are daily expected, especially with an anticipated rise in copper markets, by reason of diminished stocks reported from Chili and foreign ports. OBSERVER.

THE PHŒNIX UNITED MINES.

SIR,—I am glad that you have spoken out in reference to Phœnix United Mines. It is certainly extraordinary that such extensive and valuable mines should not be better known, and that any one could have ventured to write either unfavourably or unfairly of this property. But the fact is that the property is in the hands of those who are not concerned to advertise it, much less to puff it, as many would. This property employs nearly 500 hands, and 164 heads of stamps are constantly going; and you may judge of the rapid strides which have been made in Phœnix United from this fact that 18 months ago they were returning only 13 tons of tin per month, now they return about 46 tons, and the present profits are equal to 16 per cent. on the selling price of the shares. With regard to the finances and management, if "Shareholder" had attended our last meeting he would have been better informed, and would have learned that the business was conducted in a straightforward manner, and that no information was kept back from the shareholders. The committee consists of eight practical men of business, to whom we are greatly indebted for the sound financial condition of the company. The next meeting will be held in May, when our position will be found to be better than at the last meeting, and I hope that a dividend may be declared.—*April* 11. A SHAREHOLDER.

WEST LISBURNE MINE.

SIR,—After a long experience in this mine as a practical miner, and knowing the property from my childhood, I thought you might not consider it obtrusive on the part of anyone having that experience, and having again just paid a casual visit to it, to offer a few remarks on its appearance, productiveness, and character at the period I have before referred to, as well as to offer my sincere congratulation on the surprising and highly satisfactory progress made in its re-opening. I well remember, when a boy, that four men and four boys (I being one of them) were stoping the back of the 8 fm. level west of western winze, and in four months from these stopes we broke had drawn to surface and made marketable 131½ tons of silver-lead ore, realising at that time 16*l.* per ton. It will, therefore, appear evident, I may say certain, that in the back of the 36 fm. level there must be a large quantity of rich lode of the same character and productiveness as the former stopes over the 8 fm. level, being, in fact, the same course of ore. I, therefore, think it would be well to stope this ground and bank the ore until dressing machinery is applied, one of the principal parts, a good crusher mill, I saw on the mine. There are several and various very interesting points in the lode east from old engine-shaft and west of it and between this and London shaft, from which large returns have been made, and at other points, and in fact throughout the mine, even up to its present depth. There is such a large quantity of rich gossan crystallisation and ore showing in the lode that it may be very safely concluded that at the present depth of the mine that it is merely in its infancy; and if I may be allowed to offer an opinion upon it I would say go on and drive the 46 fm. level west and the 36 fm. level east and west, sink the new perpendicular shaft, open out your levels energetically, and at each alternate depth it is my decided opinion the lode will be found more rich, productive, and profitable, and that the manager will have the satisfaction, at no distant date, with the application of boring machines, of being thoroughly borne out in his statements; and with his untiring energy will bring to light one of the best, if not the best, paying mine in Cardiganshire.

I consider the arrangements for the continuous working of the mine to be admirable, as in the case of drought or frost the steam engine will be master of the situation, whilst the large water-wheel can be applied at all times when there is a sufficiency of that element, and thus effectually economise the cost of working the mine. In conclusion, I cannot do less than congratulate the company in having such a splendid property, and in having a manager who has so skilfully conducted their operations. H. F., jun.

Llanidloes, April 13.

THE PRESERVATION OF IRON—BARFF'S RUSTLESS PROCESS.—The advantage of preserving iron and steel from rust is now being recognised by manufacturers and others, and to Professor BARFF is due the credit of being the first to undertake to coat those metals with magnetised oxide, produced designedly for the purpose of protecting their surfaces from rust. The process is now being extensively carried on by Mr. Spencer, of West Bromwich, more especially in connection with tubes and fittings, which being exposed at a high temperature to the action of superheated steam are covered by a film of black oxide of a thickness that can be determined by the degree of temperature and the length of exposure. The magnetic oxide consists of three times 56 parts by weight of iron and four times 16 parts by weight of oxygen. The oxide is harder than the original iron, and adheres to it, then the particles of iron adhere to each other, so that there is a marked gain not only in the chemical but also in the mechanical resistance. If the operating chamber is heated at only 50° Fahr., and the exposure is continued for five hours, a surface is obtained that will resist emery paper for a considerable time, and will not rust within doors or after any ordinary degree of exposure to moisture. If the oxiding process is continued at 1200° Fahr., and continued for six or seven hours, the surface will be such that it will resist a rasp, and in that state stand any amount of exposure to the weather, whilst the oxidisation does not affect the appearance of the surface in any other way than by turning it black. A rough forging retains its roughness, and a turned or polished surface retains all its smoothness. Should there be any flaw in the coating or if the black oxide is purposely removed from part of the surface the common oxidation will occur where the iron is thus left unprotected. In Russia a particular kind of sheet-iron is manufactured which has not been produced elsewhere, being remarkable for its smooth, glossy surface, which is dark metallic grey, and not of the bluish grey like that of common sheet-iron. The same effect and object is obtained by the Barff process, that of subjecting iron and steel to the action of superheated steam, and when they are at a temperature sufficiently high, as previously stated, the iron seizes the oxygen, and the product of the union is magnetie oxide. The same object is obtained by heat obtained from gas, by what is known as the Bowar process. The Barff system, however, is admitted by Mr. Bowar to be the best for wrought-iron, and we are told that a furnace has been constructed combining the two systems, by either of which articles can be coated. Already the process has been extensively adopted on the Continent, and from its valuable preservative properties it should commend itself to those who have iron in an exposed or moist position, and for such in particular its value cannot be over estimated.

AUSTRIAN ROCK BORING MACHINERY.—The memoir containing details of the latest practical results obtained with Jarolimek's rock-boring machines, presented to the technical mining and smelting section of the Austrian Engineers and Architects Society by Mr. Egid Jarolimek, k.k., Oberbergrath, and published in the Oesterreichischen Zeitschrift für Berg und Huttenwesen, has been reprinted in pamphlet form. It is illustrated by a well executed plate showing the improvements in the construction which have been introduced.

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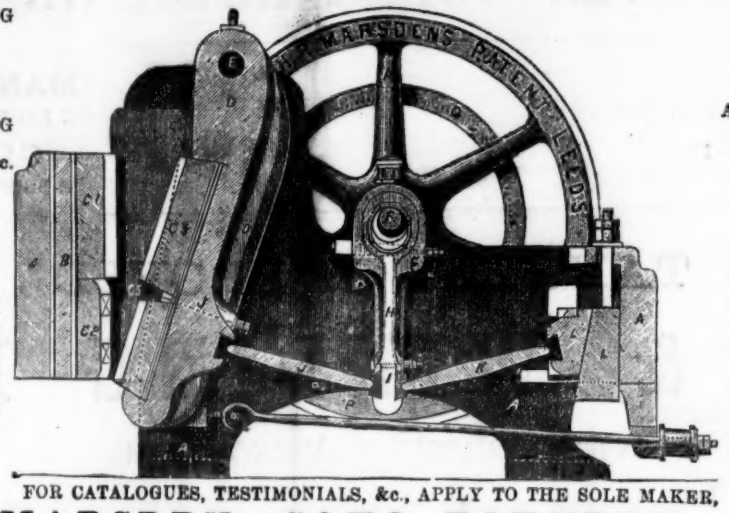

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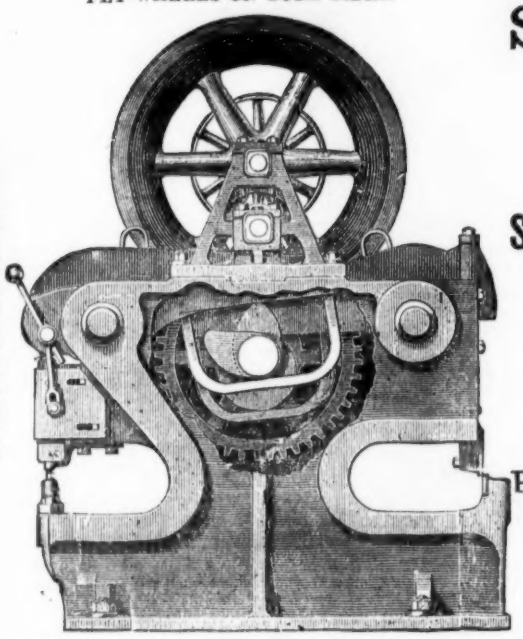

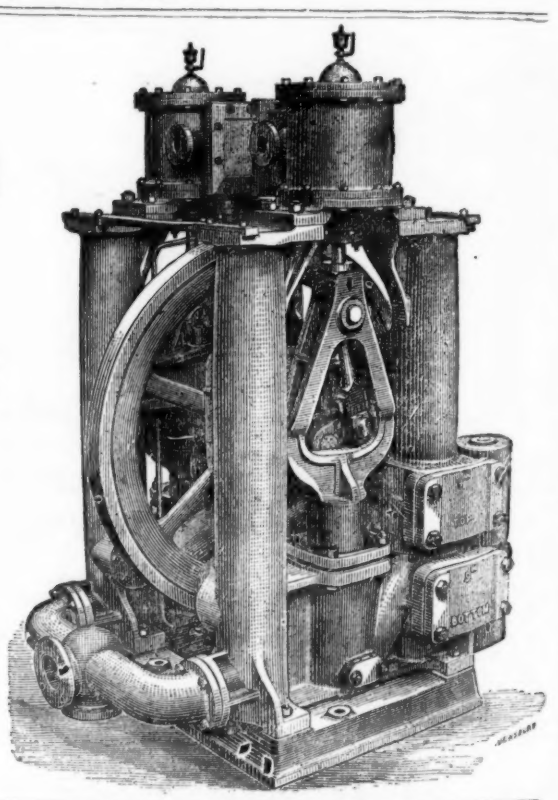

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